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## State of California AIR RESOURCES BOARD

## EXECUTIVE ORDER U-R-6-3

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

## ISUZU MOTORS LIMITED

Pursuant to the authority vested in the Air Resources Board by Sections 43000.5, 43013 and 43018 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the following Isuzu Motors Limited 1997 model-year engine, with rated power between 175 and 750 horsepower, and exhaust emission control systems are certified as described below for use in heavy-duty off-road equipment:

Typical Equipment Usage: Hydraulic Excavator

Fuel Type: Diesel

Engine Family	Liters (Cubic Inches)	Exhaust Emission Control Systems and Special Features
VSZ9.8R6DARA (9.8RD)	9.8 (600)	Turbocharger

Engine models and codes are listed on attachments. Production engines shall be in all material respects the same as those for which certification is granted.

The total hydrocarbons (THC), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter (PM) certification exhaust emission standards, in grams per brake horsepower-hour (g/bhp-hr), and the opacity of smoke emission standards, in percent (%), during acceleration (Accel), lugging (Lug), and peak (Peak) modes, for this engine family are (Title 13, California Code of Regulations, Section 2423):

Exhaust	<u>Emissions</u>	(g/bhp-hr)	·	Smoke C	pacity ( %	
THC	<u>co</u>	NOx	<u>PM</u>	<u>Accel</u>	Lug	<u>Peak</u>
1.0	8.5	6.9	0.4	20	15	50

The THC, CO, NOx and PM exhaust emission certification values, in g/bhp-hr, and the opacity of smoke emission certification values, in percent (%), for this engine family are:

	<u>Exhaust</u>	Emission	(g/bhp	<u>-hr)</u>	Smoke C	pacity (	( % )
Engine Family	THC	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	Lug	<u>Peak</u>
VSZ9.8R6DARA (9.8RD)	0.4	1.1	6.4	0.3	15	10	23

BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with the Board's emission control system warranty provisions (Title 13, California Code of Regulations, Section 2425 et seq.).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

Executed at El Monte, California this

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day-of December 1996.

R. B. Summerfield, Chief
Mobile Source Operations Division

E.O. # <u>U-R-6-3</u>

## 1997 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET HEAVY - DUTY OFF - ROAD DIESEL ENGINES

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Displacement: All Codes in Eng Valves / Ports p Maximum Rate Ignition: Comp Fuel Type(s): I  Diesel Cert Fue Primary Service Exhaust ECS (	9.8 / 60 g Fam: CA er Cylinder d Power: oression Dedicated CNG Li l: 40 CFR e Equipment (e.g., MFI, T	00 Liters/Cu 49S 5 2 249.6 Compress Flex- Fuel NG LPG _ 86.1313- 94 _× :	Engine bic Inches  0S_X Cert To Strokes po HP (186.1 ion with Glow Plu Dual- Fuel Other (specifor the deciration of the content of the conten	Eng Configerst Procedures or Combustion  KW) @ g × Diesel × fy) fy fix Excavator	g:L6 s: ARB n Cycle2200 S M100	/ OHC EPA_X
Engine Model (Eng. Code)	Rated HP @ RPM	Fuel Rate  @ Rated HP  mm³ / stroke  (lbs / hr)	Fuel Pump & Injector Part No.	ECM /PCM Part No.	EGR Valve Part No.	PTOX Catalytic Converter Part No.
9.8RD- A 9.8RD- B 9.8RD- C 9.8RD- D	250/2200 241/2000 174/2200 170/2000	130.6 (95.9) 132.3 (88.4) 92.2 (67.7) 94.1 (62.8)	Pump 115602975 (×) 115603074 (×) or 115603075 (×) Injector 115300289 (×)	N/A	N/A	N/A
(×): Suffix ar  Date Issued:  Revisions:	ny figure fron	n 0 to 9.				